

### Ducted-Fan Unmanned Aircraft Systems (UAS)

# Hovering UAVs Provide Better Access in Difficult Situations



### Technology and Innovation

Unmanned aerial vehicles need to be designed to meet the diverse, often clandestine needs of military, law enforcement, and homeland security personnel. Historically, UASs designed with ducted-fan technology have had problems with control, noise and mechanical reliability. Aurora Flight Sciences, in their most significant SBIR-funded work, set out to overcome these problems with the development of ducted-fan UASs that can take off vertically, hover like a helicopter, and transition to horizontal wing-borne flight that is faster and more fuel-efficient. The ducted-fan's enclosed propeller increases soldier safety and aircraft survivability during operations in urban environments.

The company's UASs include the GoldenEye-50, the GoldenEye-80 and the Excalibur. The backpackable GoldenEye-50 is a versatile platform designed for tactical surveillance and chemical agent detection missions in restricted, hard to reach or dangerous locations. The GoldenEye-80 is targeted for low-cost, tactical reconnaissance, surveillance, and target designation missions. Excalibur is an armed, tactical UAS that fills the gap between current weaponized UASs and manned strike platforms to provide tactical air support.

### Joint Collaborations

Aurora's success on more than 20 DARPA SBIRs has enhanced their



collaborative and contract opportunities. In addition, the company has developed strategic relationships with major defense companies including Northrop Grumman, Boeing, Raytheon, and Sikorsky. Aurora is in discussion with the U.S. Army, U.S. Special Operations Command, allied military services, and law enforcement organizations about their interests and applications of the ducted-fan UAS technology.

Aurora's unmanned aerial vehicles transition from horizontal to vertical flight, hovering in specified areas

### Lessons Learned

- Be prepared to make course adjustments to move the technology on to the next SBIR phase.
- Identify government restrictions that may affect transitioning technologies developed under DARPA to the private sector.
- Use the SBIR process to start a business around a novel idea, and then leverage

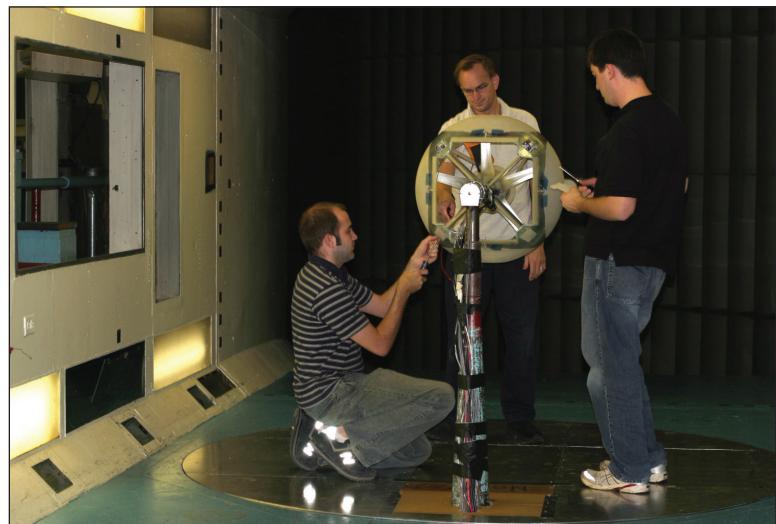
other financial sources including non-SBIR contracts and corporate investment.

- To transition into Phase III, focus on developing a technology that will mesh with end-user operational requirements. Without this focus, there is a danger of creating outstanding technology that will not be procured because it does not align with requirements.

### Economic Impact

All of Aurora's vertical takeoff and landing UAS technology had its genesis in DARPA SBIR work. An SBIR helped Aurora develop the ducted-fan technology that enables it to compete for the U.S. Navy Small Tactical Unmanned Aircraft Systems (STUAS)/U.S. Marine Corps Tier II UAS program.

Since 2000, Aurora has maintained an average compound annual growth rate in excess of 40 percent. Much of that growth has been driven by SBIR projects, resulting technologies, and the reputation the company built during the performance of SBIR contracts. Aurora also holds several patents directly traceable to work performed with SBIR support.



Testing the ducted-fan technology

### About the Company

Aurora Flight Sciences, founded in 1989, is one of the leaders in UAV technology for research, defense, and homeland security organizations. For more than 17 years, Aurora has expanded the limits of unmanned flight through the design and manufacture of innovative aircraft. The company also specializes in the manufacture of composite and metal aerostructures for manned and unmanned aircraft. ■

### Company Information

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